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Department of Household Science

Experiments in Teaching
Food Values



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This bulletin contains data gathered from different phases of the work of the Department, and is presented in the hope that it may be helpful in showing different methods of acquiring knowledge of the important subject of food values.

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EXPERIMENTS IN TEACHING FOOD VALUES

INTRODUCTION¹

The past year has emphasized every phase of the food question. This emphasis has fallen on the producer, the consumer, rich and poor, high and low, alike.

The University of Illinois has many avenues of approach to this question. Its classes in selection and preparation of food and in dietetics, its practise apartment, and its lunch room, each has studied its particular part of the problem with unusual care. Some of the results are given in the hope that they may be of use to the housewife in her important responsibility as regards foods.

As a nation we are awaking to the necessity for food conservation, and at this time the rôle of the housewife looms as large as that of the producer. Conservation of the food as it is daily prepared in our homes does not mean "skimping" so that the members of the family are undernourished. It does mean, however, wise buying, careful preparation, and the elimination of waste both in preparation and in consumption. These results cannot be accomplished unless the housewife understands food values and the varying needs for nourishment represented in her family. She will then be able to serve meals suitable and sufficient for the development of physical efficiency and yet avoid the preparation of too much food or too much of any one kind of food.

Food must serve a threefold purpose: it must furnish the materials for building the body, for regulating many of its processes, and for supplying energy for its work. Proteins, fats, carbohydrates, mineral matter, and water, constituents of the various food stuffs, all are used to build the body, but protein and mineral matter need especial emphasis, for protein is the most important constituent of all living tissue, and mineral matter is essential for the building of bones. Proteins are obtained mainly from meat, peas, beans, milk, eggs, cheese, and nuts. Mineral substances are present in all foods, but the most valuable sources are milk, fruits, and vegetables. The materials in food which help to regulate body processes are the mineral substances. They are important constituents of blood and other

¹Contributed by Miss Mary C. deGarmo, M.A., and Miss Marie Freeman, A.B.

body fluids, and they furnish acids and alkalies for the digestive juices.

When we consider the sources of energy for body work, we use as a unit of measure the "calorie." This term is no longer confined to textbooks. The calorie is slowly coming to its own in the public mind; we are realizing that price and quantity are not indications of the value of most foods to the body, but that the calorie is the standard by which the actual amount of fuel can be determined. Fats, carbohydrates, and proteins furnish energy, but proteins leave unburned material which must be excreted, so for this reason as well as because of the greater expense of proteins, fats and carbohydrates are more desirable for the purpose of energy. Fat furnishes two and one-fourth times as many calories as either carbohydrates or protein, and is, therefore, the most concentrated fuel. The chief sources of fats are butter, cream, lard, bacon, salad-oils, salt pork, and nuts. Carbohydrates are obtained in the form of starchy foods, such as cornstarch, potatoes, cereals, macaroni, and bananas, and in fruits, syrups, and sugar.

In order to know how much of each of these kinds of food is required for the family, the activity, size, and age of each member must be considered. The first of these is the largest factor. A farmer doing active work out-of-doors can use a quantity of concentrated foods which would be a severe trial to the digestive system of a bookkeeper. Atwater and Benedict give the following table to show the effect of exercise on food requirements:

	Calories per hour
Man sleeping	65
Man sitting at rest.....	100
Man at light muscular exercise.....	170
Man at active muscular exercise.....	290
Man at severe muscular exercise.....	450
Man at very severe muscular exercise.....	600

From these figures we should consider 2,500 calories per day a fair average for a man doing sedentary labor, 3,000 calories per day for labor involving moderate exercise, and 4,000-6,000, for very severe labor.

Size in terms of weight is another factor in determining the necessary amount of food. The more muscle tissue an individual has, the higher the energy requirement. Women as a class require less food than men because they are usually smaller and less active. Using the above table we should consider 2,200 calories per day sufficient for a woman of average size doing moderate exercise.

However, a man at sedentary labor would need less food than his wife if she was large and doing strenuous physical work.

Children require twice as many calories per pound as adults, tho the total is less until the year preceding adolescence. An adolescent boy needs as much food as his father. Because of the rapid rate of growth, children should have double the amount of protein required by adults. Mrs. Rose¹ gives these quantities as sufficient:

CALORIE REQUIREMENT IN CHILDHOOD

Age in years	Weight in pounds	Calories per pound
2	29-30	40
3	35	40
4	37½	40
5	41	35-37
6	45	34-35
7	50	32-34
8-9	..	30-35
10-12	..	28-32

For adolescence, Eugene DuBois² gives the following requirement:

CALORIE REQUIREMENT IN ADOLESCENCE

Age in years	Calories per pound
12-13	30-35
14-17	25-30

For children under seven, milk furnishes more desirable constituents in an easily assimilable form than any other food. Every child should have one quart a day, part of which may be used in soups, junkets, and custards. To this, add one egg and choose the rest of the diet from fruit juices and pulps, green vegetables (sifted for little children), hard breadstuffs, and cereal foods. Older children may have the same food as their elders, except meat in quantity and pastries, providing the dishes are simply prepared. Meals should be regular and a lunch may be given in the morning or afternoon.

¹Mary Schwartz Rose, "Feeding the Family."

²Eugene DuBois, Arch. Int. Med., XVII, 887, 1916.

EXPERIMENT I¹

PLANNING OF DIETARIES

Using the preceding facts as a basis for requirements, the class in dietetics planned dietaries for this family of five:

	Age, years	Protein, grams	Total calories
Man.....	..	72	3,000
Woman.....	..	57	2,200
Girl.....	16	55	2,100
Boy.....	10	45	1,800
Boy.....	4	38	1,400
Total for family		267	10,500

These menus furnish 10,000 to 12,000 calories of which 10 to 15 percent is in the form of protein. At present prices, the cost per day averages \$1.25, or 25 cents per person. This figure makes it impossible to have a variety at every meal. Breakfast was chosen as the meal in which monotony was of least importance, and variety was given in the other two meals.

There is considerable distrust of "scientific feeding" and we are apt to think that eating according to calories would mean new and strange combinations. These meals show that the contrary is true. Ordinary foods, simply prepared, and combined with a view not only to flavor but to food value, will furnish wholesome meals for the family. The following meals were planned for the typical family described above. The food suitable for a child of four years is starred.

SUGGESTED MEALS FOR SPRING OR SUMMER

<i>Meals</i>	<i>Dishes</i>	<i>Amounts</i>
Breakfast	Blackberries *Plain omelet Biscuits Oleomargarine Cocoa *Milk *Toast	2 cups 5 eggs 12 small 4 tablespoons 4 cups 1 cup 1 slice
Child's morning lunch	*Milk *Zwieback	1 cup 1 piece
Lunch or supper	*Baked beans *Boston brown bread Oleomargarine *Stewed rhubarb Oatmeal wafers *Milk	4 cups 9 slices 5 tablespoons 2 cups 9 wafers 1 cup

¹Contributed by Miss Mary C. deGarmo, M.A., and Miss Marie Freeman, A.B.

<i>Meals</i>	<i>Dishes</i>	<i>Amounts</i>
Dinner	Baked ham *Creamed cauliflower String beans Bread Oleomargarine Vanilla ice cream (yolks of eggs) Marguerites (whites cf eggs) *Milk *Hard bread	7 medium slices 1 small head 3 cups 8 slices 4 tablespoons 1½ pints 8 marguerites 1 cup 1 slice
Breakfast	*Peaches *Grapenuts *Milk toast *Milk	1 pound 10 tablespoons 12 pieces 3 cups
Child's morning lunch	*Bread *Oleomargarine	1 slice ½ tablespoon
Lunch or supper	Rice croquettes *Lima beans *Bread Oleomargarine *Baked bananas *Milk	7 croquettes 9 tablespoons 6 slices 4 tablespoons 6 bananas 2 cups
Dinner	Roast tongue Macaroni and tomatoes Lettuce, French dressing *Bread Oleomargarine *Plain cookies *Snow pudding *Milk	1 pound 3 cups 1 head 8 slices 4 tablespoons 10 cookies 2⅔ cups 1 cup
Breakfast	*Stewed rhubarb Puffed Wheat *Oatmeal *Cream toast *Milk Coffee Sugar	1½ cups 3 cups ¼ cup 5 slices 4½ cups 2 cups 4 tablespoons
Child's morning lunch	*Milk *Toast	1 cup 1 slice
Lunch or supper	*Cream of pea soup *Croutons Stuffed tomatoes *Graham bread *Oleomargarine Apple sauce cake Tea *Milk *Apple sauce	5 cups 3 slices of bread 4 tomatoes 5 slices 5 tablespoons 4 slices 2 cups 2 cups 2 tablespoons

<i>Meals</i>	<i>Dishes</i>	<i>Amounts</i>
Dinner	Beef loaf *Creamed carrots Spinach with egg Tomato and lettuce salad Bread *Toast Oleomargarine *Chocolate blanc mange *Milk	4 medium slices $2\frac{1}{4}$ cups 3 cups 2 large tomatoes 8 slices 1 slice 4 tablespoons $2\frac{1}{4}$ cups 1 cup
Breakfast	*Cantaloup Corn flakes *Wheatena Popovers Oleomargarine Cocoa *Milk	5 halves $2\frac{1}{2}$ cups $\frac{1}{4}$ cup 8 popovers 6 tablespoons 4 cups 3 cups
Child's morning lunch	*Bread *Milk	1 slice $\frac{3}{4}$ cup
Lunch or supper	*Creamed eggs on toast Orange and date salad Bread Oleomargarine *Rice pudding with raisins	5 slices toast, 5 eggs 2 cups 5 slices 5 tablespoons
Dinner	Stuffed baked heart *Mashed potatoes *Creamed celery Olives Bread Oleomargarine *Raspberry (canned) sherbet *Toast *Milk	1 pound $2\frac{1}{2}$ cups $2\frac{1}{4}$ cups 8 olives 8 slices 4 tablespoons $2\frac{1}{4}$ cups $\frac{1}{2}$ slice 1 cup

SUGGESTED MENUS FOR FALL OR WINTER

<i>Meals</i>	<i>Dishes</i>	<i>Amounts</i>
Breakfast	*Stewed prunes *Oatmeal *Milk Sugar *Toast Oleomargarine	16 prunes, or $\frac{3}{8}$ pound $2\frac{1}{4}$ cups 1 pint 4 tablespoons 9 slices 4 tablespoons
Child's morning lunch	*Milk	1 cup
Lunch or supper	Vegetable soup Bacon and fried apples Bread Oleomargarine Caramel junket	5 cups 7 slices bacon, 5 apples 9 slices 5 tablespoons $2\frac{1}{2}$ cups

<i>Meals</i>	<i>Dishes</i>	<i>Amounts</i>
Dinner	*Cheese soufflé *Rice Green bean and beet salad *Bread *Butter *Sponge cake *Milk	10 tablespoons 2 cups 2 cups 9 slices 4 tablespoons 5 slices 1 cup
Breakfast	*Sliced bananas, very ripe *Farina *Oleomargarine *Toast Coffee Sugar *Milk	3 bananas 2 $\frac{1}{4}$ cups 4 $\frac{1}{2}$ tablespoons 9 slices 2 cups 2 tablespoons 2 cups
Child's morning lunch	*Milk *Graham crackers	1 cup 2 crackers
Lunch or supper	Salmon croquettes *Creamed cabbage Currant jelly Bread *Oleomargarine *Milk *Zwieback	8 croquettes $\frac{1}{2}$ pound $\frac{1}{2}$ glass 8 slices 4 $\frac{1}{2}$ tablespoons 1 cup 1 piece
Dinner	*Cream of tomato soup Ragout of beef *Buttered squash Bread Oleomargarine Raspberries Frosted cakes	5 cups 4 servings 2 $\frac{1}{4}$ cups 9 slices 4 $\frac{1}{2}$ tablespoons 2 cups 10 cakes
Breakfast	*Apricots *Oatmeal *Milk *Toast Oleomargarine	5 tablespoons 2 $\frac{1}{2}$ cups $\frac{3}{4}$ quart 5 slices 4 tablespoons
Child's morning lunch	*Milk *Zwieback	1 cup 1 piece
Lunch or supper	*Omelet and parsley *Bread *Butter Jelly Prune whip *Milk	6 eggs 8 slices 5 tablespoons 4 tablespoons 4 servings 1 cup
Dinner	Swiss steak *Rice gravy *Buttered beets Corn scones Oleomargarine Pumpkin pie *Milk *Toast	1 $\frac{1}{4}$ pounds 2 $\frac{1}{4}$ cups 2 $\frac{1}{4}$ cups 8 scones 4 tablespoons 4 pieces 1 cup 1 slice

<i>Meals</i>	<i>Dishes</i>	<i>Amounts</i>
Breakfast	*Oranges One-egg muffins Oleomargarine Poached eggs *Toast *Milk	5 halves 8 muffins 5 tablespoons 5 eggs 1 slice 1 cup
Child's morning lunch	*Milk *Cracker	1 cup 1 cracker
Lunch or supper	Scalloped corn *Bread *Butter *Cottage cheese Strawberry jam *Milk	8 tablespoons 9 slices 4 tablespoons 5 tablespoons 4 tablespoons 1 cup
Dinner	Pork chops and gravy *Baked potatoes *Buttered onions Biscuits Oleomargarine Baked apples in syrup *Hard bread *Milk	4 chops 5 medium 9 tablespoons 8 biscuits 4 tablespoons 5 apples 1 slice 1 cup

Oleomargarine is used in most of the menus because the price of butter in town is too high for the allowance of \$1.25 per day. Where butter costs less than 25 cents per pound, it can be used in place of oleomargarine.

These meals would cost very much less in many towns and in the country. Cost may be reduced by:

1. More extended use of such cereals as corn, rye, and oatmeal
2. Home canning and baking
3. Preserving eggs for winter use
4. Use of inexpensive cuts of meat
5. Buying staples in quantity
6. Raising vegetables and small fruits in the family garden

EXPERIMENT II¹

A STUDY OF THE DIETARY HABITS OF CAFETERIA PATRONS

A study of the dietary habits of cafeteria patrons, recently made by the class in dietetics, has given results which may prove suggestive to the housewife in planning meals for the day. Five patrons, chosen as types of various groups taking lunch at the cafeteria, kindly cooperated by allowing their lunches to be observed each day.

We assume that a fair standard for a man at moderate work is 2,400 calories and for a woman, 2,200 calories, of which 10 to 12 percent of the total calories should be in the form of protein. Lunch or supper should furnish approximately one-third of the total calories for the day, or 750 to 800 calories, of which 75 to 96 should be of protein. If the morning meal is light, a heavier meal at noon would be required.

LUNCHES OF STUDENT MAN

(A)

Beef à la mode	Gravy
Baked beans	Bread, 2 slices
Mashed potatoes	Butter
Vanilla ice cream	
<i>Protein Calories</i>	<i>Total Calories</i>
255.11	1,268

(B)

Vegetable soup	Rolls, 2
Wafers, 4	Butter
Browned potatoes	Vanilla ice cream
Baked beans	Cocoanut cake
<i>Protein Calories</i>	<i>Total Calories</i>
96.66	1,346.3

In Lunch A of the Student Man, protein furnished 255 calories of the total of 1,268, or 20 percent. Lunch B of the same man gave 96.66 protein calories of the total of 1,346 calories, or only 7 percent protein.

¹Contributed by Miss Mary C. deGarmo, M. A., and Miss Marie Freeman, A. B.

LUNCHES OF FACULTY WOMAN I

(A)	Pork chops Mashed potatoes <i>Protein Calories</i> 120.1	Nut cake	Gravy Strawberries <i>Total Calories</i> 667.2
(B)	Meat croquettes Browned potatoes Bread <i>Protein Calories</i> 73.4		Butter Ice cream Chocolate cake <i>Total Calories</i> 987.9

Lunch A of Faculty Woman I gave 120 calories of protein, or 18 percent of the total of 667 calories. Lunch B of the same woman gave 73 protein calories, or 7.3 percent of 988 calories.

LUNCHES OF FACULTY WOMAN II

(A)	Baked eggs Navy beans Baked creamed potatoes <i>Protein Calories</i> 129.84	Bread, 2 slices Butter Apple pie <i>Total Calories</i> 1,054.12
(B)	Baked eggs Mashed potatoes Gravy <i>Protein Calories</i> 91.44	Bread, 2 slices Butter Apple pie <i>Total Calories</i> 841.12
(C)	Lima beans Mashed potatoes Gravy <i>Protein Calories</i> 58.99	Peach, $\frac{1}{2}$ Bread, 2 slices Butter Lemon pie <i>Total Calories</i> 820.6

Many of the lunches were monotonous, lacking variety in choice of food and in preparation. For example, in the lunches of Faculty Woman II, on three consecutive days pie and potatoes were chosen, and baked eggs on two days. The absence of fresh fruits and vegetables was striking in the menus given above and also in the following:

LUNCHES OF STUDENT GIRL

(A)

Creamed beef		Vanilla ice cream
Frankfurter		Cocoanut cake
<i>Protein Calories</i>		<i>Total Calories</i>
86.86		933.0

(B)

Baked beans		Browned potatoes
Scrambled eggs		Bread
	Butter	
<i>Protein Calories</i>		<i>Total Calories</i>
68.4		695.1

(C)

Meat croquettes		Butter
Browned potatoes		Chocolate ice cream
Bread		Chocolate cake
<i>Protein Calories</i>		<i>Total Calories</i>
113.7		1,294.6

In the lunches of the Student Girl it will be seen also that important sources of minerals, organic acids, and substances essential for growth were eliminated. "Roughage" was low because the foods chosen, tho high in energy, were concentrated and easily absorbed, furnishing no indigestible substances to serve as ballast.

The averages of the fuel values of the lunches of each person for the fifteen days were:

Patron	Calories
Faculty Man	768
Faculty Woman I	775
Faculty Woman II	924
Student Girl	931
Student Man	1,028

It will be seen that three of the five ate lunches yielding more energy than would be required provided each ate three meals a day. Lunches furnishing 1,054, 1,268, 1,294, and 1,346 calories contain one-half the fuel necessary for a day. The amount of protein shows considerable variation; also the highest protein, as in Lunch A of the Student Man, is not synonymous with the highest fuel value. The greatest fuel value was obtained from his Lunch B, containing only 7 percent of the total fuel value in protein.

SUGGESTED COMBINATIONS

In order to help patrons choose suitable combinations of foods, giving not only sufficient energy and the proper proportion of protein, but mineral substances, fresh foods, and ballast, the arrangement of the menu cards was changed and the foods were grouped in this way:

- ¹(1) Meat and meat substitutes—protein
- (2) Green vegetables and fruits—acids and minerals
- (3) Starchy and creamed vegetables—starches
- (4) Desserts other than fruits—sugars and fats

Charts containing the following suggestions were hung by the menu board:

MENU A

Take

- (1) Meat
—or Meat substitute:
Eggs
Macaroni and cheese
Rice and cheese
—or Cream soup
and
(2) Rice
—or Macaroni
—or Potatoes
—or Hominy
—or Creamed vegetable
and
(3) Green vegetable
—or Salad
—or Fruit
—or Vegetable soup
—or Relishes
and
(4) Bread and butter

MENU B

Take

- (1) Meat
—or Meat substitute:
Eggs
Macaroni and cheese
Rice and cheese
—or Cream soup
and
(2) Green vegetable
—or Fruit
—or Salad
—or Vegetable soup
—or Relishes
and
(3) Pie
—or Cake
—or Pudding
—or Ice cream
and
(4) Bread and butter

¹Adapted from Caroline L. Hunt and Helen W. Atwater, "How to Select Foods," Farmers Bulletin 808, United States Department of Agriculture.

EXPERIMENT III¹

DATA FROM PRACTISE APARTMENT

This third experiment is of a very different type from the first two. In this one, emphasis is put upon the ability of the student to apply her knowledge of foods, to coordinate the elements of time, cost, and method of work in order to produce satisfactory results in several lines. For almost every student, it is the first experience in this kind of responsibility, so this is in a very real sense a report of student work.

The following meals were prepared in the practise apartment by one student and served by another to a group of four—the instructor, a guest, and the two students who were working. The first period of five days began with Monday, February 19, 1917, and the second with Monday, May 14, 1917. These two periods were chosen because they serve to illustrate, among other factors, the influence of the season.

MEALS FOR FIVE DAYS IN FEBRUARY

Monday

Breakfast: Cracked wheat, toast, butter, coffee, cream

Luncheon: Cottage cheese salad, biscuit, butter, tea

Dinner: Pot roast of beef, mashed potatoes, lettuce and nut salad, rolls, butter, birds' nest pudding

Tuesday

Breakfast: Oranges, toast, butter, coffee, cream

Luncheon: Beef stew, bread and butter, tea

Dinner: Pork chops, boiled rice with gravy, bread and butter, Waldorf salad, mock mince pie, coffee, cream

Wednesday

Breakfast: Stewed peaches, muffins, butter, coffee, cream

Luncheon: Casserole of meat and vegetables, bread and butter, tea

Dinner: German steak, creamed potatoes, bread and butter, lettuce salad, lemon ice, wafers

Thursday

Breakfast: Oranges, rolled oats, toast, butter, coffee, cream

Luncheon: Cream of tomato soup, cottage cheese salad, bread and butter

Dinner: Swiss steak and gravy, mashed potatoes, creamed cauliflower, hot rolls, butter, apple pie, coffee, cream

¹Contributed by Miss Cora E. Gray, M.S.

Friday

Breakfast: Prunes, corn flakes, toast, butter, coffee, cream
 Luncheon: Croquettes, baking powder biscuits, butter, apple butter, tea
 Dinner: Pot roast of beef, gravy, mashed potatoes, scalloped corn, bread and butter, Waldorf salad, cottage pudding

MARKET LIST FOR FIVE DAYS IN FEBRUARY

Meats	Eggs, dairy products, and fats	
Beef chuck, 2 lbs.....\$.50	Eggs, 3\$.112	
Pot roast, 1½ lbs..... .30	Cottage cheese, 1 pt..... .10	
Swiss steak, 2¾ lbs..... .60	Milk, 3½ qts..... .25	
Pork chops, 1½ lbs..... .30	¹ Butter, 1½ lbs.66	
—	Oleomargarine, ½ lb..... .12	
	Crisco, 1 lb..... .20	
		\$1.542
Fruits and vegetables	Groceries	
Apples\$.12	¹ Sugar, 3½ lbs.\$.228	
Apple butter, 1 glass home canned06	¹ Flour, 4½ lbs..... .27	
Cauliflower, 115	Corn flakes, 2¼ oz..... .02	
Celery, 2 bunches..... .23	Cracked wheat, 4 oz..... .02	
Lemons, 205	Rice, broken, 1 lb..... .06	
Lettuce, 1 lb..... .20	Rolled oats, 6 oz..... .03	
Oranges, 410	Bread, homemade02	
Peaches, ½ lb.063	Wafers05	
Potatoes, 7½ lbs..... .413	Peanuts05	
¹ Prunes, ½ lb.05	¹ Coffee, 7 oz.13	
Raisins055	¹ Tea022	
Tomatoes, canned12		\$1.30
	Total for food materials....\$6.153	

MEALS FOR FOUR DAYS IN MAY

Tuesday

Breakfast: Oranges, poached eggs on toast, butter, coffee, cream
 Luncheon: Rice croquettes, muffins, butter, jelly, pears, iced tea
 Dinner: Veal steak, new potatoes, creamed cauliflower, bread and butter, canned pineapple, wafers

Wednesday

Breakfast: Oranges, bacon, toast, butter, coffee, cream
 Luncheon: Potatoes au gratin, bread and butter, stewed rhubarb, wafers, iced tea
 Dinner: Pork chops, creamed new potatoes, radishes, bread and butter, strawberry shortcake

Thursday

Breakfast: Oranges, bacon, toast, butter, coffee, cream
 Dinner: Swiss steak, mashed potatoes, creamed turnips, radishes, bread and butter, fruit ice, wafers

¹Bought in quantity; cost estimated.

Supper: Tuna fish salad, steamed brown bread sandwiches, white bread sandwiches, iced tea

Friday

Breakfast: Stewed prunes, cinnamon toast, butter, coffee, cream

Luncheon: Rice croquettes, bread and butter, rhubarb

Dinner: Meat croquettes, mashed potatoes, creamed asparagus, bread and butter, vanilla ice cream, wafers

MARKET LIST FOR FOUR DAYS IN MAY

Meats

Veal steak, 1 lb.....	\$.25
Round steak, 1 lb. +.....	.28
Hamburger, $\frac{1}{2}$ lb.....	.10
Bacon, $\frac{1}{2}$ lb.....	.15
Pork chops, 1 lb.....	.35
Tuna fish, 1 can.....	.20

Eggs, dairy products, and fats

Eggs, $\frac{1}{2}$ doz.....	\$.18
Milk, 5 qts.....	.50
Butter, $1\frac{1}{4}$ lbs.....	.53
Lard, $\frac{1}{8}$ lb.....	.03
	—
	\$1.24

— \$1.33

Fruits and vegetables

Apple jelly, 1 glass, home product	\$.06
Asparagus, 1 bunch.....	.10
Cauliflower, 1 large head.....	.20
Lettuce, 1 head.....	.05
Oranges, 412
Canned pears, 1 can, home product15
Canned pineapple, 1 can.....	.15
Potatoes, 4 lbs.....	.30
Prunes, $\frac{1}{2}$ lb.....	.07
Radishes, 1 bunch.....	.05
Rhubarb, 2 bunches.....	.10
Strawberries, 1 box.....	.15
Turnips, 2 bunches.....	.10

Groceries

¹ Sugar, 2 lbs.....	\$.164
¹ Domino Sugar, 2 oz.....	.021
¹ Flour, $1\frac{1}{8}$ lbs.....	.073
¹ Oatmeal, 3 oz.....	.015
¹ Rice, $\frac{1}{2}$ lb.....	.05
White bread45
Brown bread07
Cookies15
¹ Coffee, 4 oz.....	.072
¹ Tea03

— \$1.095

— \$1.60 Total cost of food materials \$5.265

COMPARISON OF EXPENDITURES

Foods	Amount expended		Percent of total expenditure	
	February 5 days	May 4 days	February 5 days	May 4 days
Meats	\$1.70	\$1.33	27.70	25.26
Fruits and vegetables.....	1.611	1.60	26.18	30.39
Eggs, dairy products, and fats...	1.542	1.24	25.06	23.55
Groceries	1.30	1.095	21.12	20.80
Total	\$6.153	\$5.265		
Cost per day.....	1.23	1.316		
Cost per person per day.....	.30	.32		

¹Bought in quantity; price estimated.

DISCUSSION

The total expenditure of \$6.15 for five days, or 30 cents per person per day, is not extravagant. Cream was bought only occasionally. Some of the cream from the bottle of whole milk was used for coffee; the rest of the cream with some milk was used for the cereal. Several factors tended to keep the menus simple and easy of preparation: (1) the student was limited as to the money to be expended; (2) she was loath to attempt too much in an untried field; (3) her regular University duties demanded her attention. Some of the meals may seem inadequate, but it is to be remembered that these people were engaged in sedentary occupations. Repetition, as of croquettes on the last day in the May period, is usually accounted for by the effort of the cook to have an empty ice box for her successor. The decrease in the use of meat and the increased amount of fruits and vegetables during the warm May days are interesting. The lowered cost of butter and eggs in May as compared with February accounts for the difference in the amounts expended for those foods. The increased cost of potatoes in May this year, as well as the desire for fruits and vegetables during the first really warm days of the season, made the expenditures per day larger in May than in February.

EXPERIMENT IV¹

A LESSON IN BUYING

Yet another method of studying food values is to be found in a consideration of weight, cost, and measure. This has been used by wise housekeepers for some time, but some women have been so impressed with the importance of buying by weight that they have almost lost sight of the expression of this weight in terms of measure. Very few women would think of buying bananas except by the pound, but not many realize that they will get only three medium bananas in a pound. Such a common commodity as potatoes of course are always purchased by weight, and it is very important to realize that there are 15 pounds of potatoes in a peck and that this same 15 pounds also represents about 50 medium sized potatoes. In other words, if a housekeeper buys a pound of potatoes, she will get three medium potatoes and a little one thrown in for full weight. A pound of prunes may be ordered without any special interest by the woman buyer, and she may get either large or small prunes, depending upon the grocer's wishes, while a wiser buyer would stipulate the size wanted because she would know that in a pound of small prunes she would get about 40 prunes while if they were large there would be about 28.

The following table shows the relation of cost, weight, and measure and also brings out the difference in the weight of contents of the cans of different sizes. In the case of canned pork and beans, the No. 1 can costing 15 cents weighs 11 ounces, while the No. 2 can costing 20 cents weighs 21 ounces. In the latter can, the cost of the additional 10 ounces is 5 cents. If the housekeeper uses condensed milk in quantity, it is better for her to buy the 16-ounce can, as the cost per ounce is much less than if she purchases the 6-ounce can. Of course, it may be better economy for the woman to buy the No. 2 can of vegetables, but this is true only when the No. 2 can gives her exactly enough for one meal for her family. If there is a serving left over, it is evidently wiser for her to buy the No. 3 can, because then she has enough for two meals, and, with different methods of preparation, will run no risk of monotony.

It seems clear, then, that several elements enter into the wise buying of food. One who enlists in that service ought to have a

¹Contributed by Miss Jean G. MacKinnon, M. A.

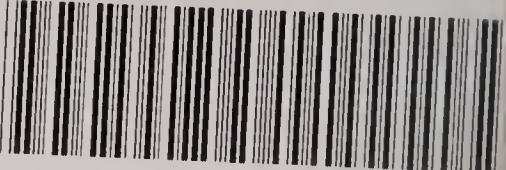
clear conception of the relation of these units of weight, cost, and measure, and, in addition, to know whether the food she buys contains chiefly proteins, carbohydrates, fats, or mineral matter, and the purpose each class serves in the body. Women have fought shy of the phrase "food values" and have preferred to "buy food," but in these strenuous days the very best service many a woman can render is determined by her ability or inability to manage her food supply. Personal and national necessity is laid upon many a woman to make of herself a wise buyer.

<i>Material</i>	<i>Weight</i>	<i>Measure</i>	<i>Cost</i> <i>May 1, 1917</i>
Apricots, medium	1 lb.	75 halves	\$.25
Bananas, medium	1 lb.	3+	.07
Beans			
Navy	1 lb.	2½ cups	.20
Lima	1 lb.	2 cups	.20
Beans, canned			
String, No. 2.....	1 lb. 2 oz.	1½ cups (drained)	.15 – .20
Lima, No. 2.....	1 lb. 4 oz.	1½ cups (drained)	.15 – .25
Pork and beans, No. 1.....	11 oz.	1½ cups	.15
Pork and beans, No. 2.....	1 lb. 5 oz.	2½ cups	.20
Beets, canned			
No. 2	1 lb. 2 oz.	40 small	.15
No. 3	1 lb. 14 oz.	65 small	.18
Beets, bunch	9 oz.	8 of 1½ in. diam.	.08
Bran, sack	3 lbs.	9+ cups	.45
Bread			
Graham	12 oz.	14 ½-in. slices	.06
Rye, Ward's	1 lb.	21 ½-in. slices	.10
White, Ward's	1 lb. 2 oz.	16 ½-inch slices	.15
Whole wheat, Ward's.....	1 lb. 4 oz.	15 ½-inch slices	.15
Butter	1 lb.	32 tbsp. or 40 squares	.52
Cabbage	1 lb. 8 oz.	1 head	.24
Carrots	2¼ oz.	4 medium	.08
Celery	6½ oz.	1 stalk	.10
Cereals			
Cornmeal	2 lbs.	7 cups	.15
	5 lbs.	17½ cups	.30
	7 lbs.	24½ cups	.35
Cream of Wheat.....	1 lb. 12 oz.	4+ cups	.20
Oatmeal	1 lb. 13½ oz.	5½ cups	.15
Pettijohn's	1 lb. 8 oz.	6¾ cups	.20
Puffed Wheat	4 oz.	8¾ cups	.15
Rolled Oats	1 lb. 4 oz.	3½ cups	.10
Shredded Wheat	12 oz.	12 biscuits	.15
Cheese			
Cottage	1 lb.	1 qt.	.10
Cream	3¼ oz.	¼ cup	.10
Pimento	3¾ oz.	½ cup	.15
Cherries, candied	4 oz.	40 medium	.15
Chocolate, Baker's	8 oz.	8 squares	.25
Cinnamon	2 oz.	4 tbsp.	.20
Cocoa	8 oz.	24 tbsp.	.25

<i>Material</i>	<i>Weight</i>	<i>Measure</i>	<i>Cost</i>
			<i>May 1, 1917</i>
Cocoanut, shredded			
Package	4 oz.	1½ cups	\$.10
Bulk	1 lb.	5 cups	.25
Coffee	1 lb.	5+ cups	.28 - .30
Corn, canned, No. 2	1 lb. 4 oz.	1¾ cups	.15 - .20
Crackers			
Graham	8½ oz.	30 biscuit	.13
Long Branch, Saltines	9¾ oz.	38 double biscuits	.20
Square	4½ oz.	22 biscuits	.06
Whole wheat	12 oz.	37 biscuits	.13
Crisco	1 lb. 8 oz.	3+ cups	.50
	3 lbs. 1 oz.	6¼ cups	1.00
Currants	1 lb.	2½ cups	.35
Dates, Dromedary	10 oz.	36 dates	.15
Eggs	1¼ lbs.	1 dozen	.35
Figs, washed, package	15 oz.	18 figs	.30
Flour			
Bread	49 lbs.	3¾ cups per lb., unsifted	3.25
Entire wheat	5 lbs.	3½ cups per lb.	.45
	10 lbs.	3½ cups per lb.	.85
Graham	5 lbs.	3¾ cups per lb.	.45
	8 lbs.	3¾ cups per lb.	.65
Pastry	5 lbs.	3¾ cups per lb., unsifted	.45
Gelatine			
Knox	1 oz.	Makes 2 qts.	.20
Plymouth Rock	1½ oz.	Makes 2 qts.	.15
Jello	3¼ oz.	Makes 1 pt.	.10
Jiffy Jell	3½ oz.	Makes 1 pt.	.15
Ginger snaps, Zuzu	4 oz.	27 biscuits	.06
Hominy, bulk	1 lb.	2 cups	.0625
Junket	½ oz.	10 tablets	.10
Karo, No. 2, light or dark	2 lbs. 8 oz.	3 cups	.20
Lard, pail	3 lbs.	6 cups	.90
Lettuce			
Leaf	8 oz.	1 bunch	.05 - .10
Head	8¾ oz.	Small head	.10
Macaroni, package	10 oz.		.10
	9 lbs. 8 oz.		1.15
Milk, condensed	6 oz.	⅔ cup	.06
	16 oz.	1⅓ cups	.12
Molasses, No. 2½	2 lbs. 6 oz.	2¾ cups	.25
Mustard			
Dry	2 oz.	5½ tbsp.	.15
Prepared	8 oz.	1 cup	.15
Oleomargarine	1 lb.	32 tbsp.	.33
Olive oil, Old Monk		1 pint	.55
		1 quart	1.00
Olives		1 quart (50-60 olives)	.35
Onions, dry	1 lb.	5 large	.15
Parsnips	1 lb.	3 or 4	.07
Peas, canned, medium	1 lb. 4 oz.	1⅓ cups	.15 - .25
Pecans			
As purchased	1 lb.	90	.50
Shelled	1 lb.	3¼ cups	.90
Pepper	4 oz.	12 tbsp.	.10
Pickles			
Midget		1 quart (50 pickles)	.35
Dill	3¼ oz.	1 medium	.02

<i>Material</i>	<i>Weight</i>	<i>Measure</i>	<i>Cost</i> <i>May 1, 1917</i>
Pimento, canned	7 oz.	5	\$.15
Pineapple			
No. 1 flat	9 oz.	5 slices	.15
No. 2 tall	1 lb. 3 oz.	10 slices	.25
Potatoes, Irish	15 lbs.	1 pk. (50 medium)	.90
Prunes			
Small	1 lb.	40	.15
Large	1 lb.	28-30	.25
Pumpkin, canned	2 lbs.	3½ cups	.15
Raisins			
Seedless	15 oz.	2½ cups	.18
Seeded	15 oz.	1¾ cups	.15
Rice	1 lb.	2 cups	.10
Salmon (flat)	7 oz.	1¾ cups	.15 - .20
Salt	1 lb.	1⅓ cups	.015
Soda	1 lb.	2+ cups	.10
Spaghetti	12 oz.		.15
Spinach, canned, No. 2	1 lb. 2 oz.	2+ cups	.15
Starch, cornstarch	1 lb.	2½ cups	.10
Sugar			
Brown	1 lb.	2⅔ cups	.12
Confectioners', package	1 lb.	2¾ cups	.15
Granulated	25 lbs.	2 cups per lb.	2.75
Loaf	2 lbs.	200 half-size pieces	:30
Tapioca			
Instant	10 oz.	1¾ cups	.15
Minute	10 oz.	1¾ cups	.15
Pearl	1 lb.	2¼ cups	.15
Tea	1 lb.	5½ cups	.80
Tomatoes, canned No. 2	1 lb. 3 oz.	3½ cups	.15 - .20
Vanilla wafers, package	5 oz.	26 biscuits	.13
Vinegar		1 gallon	.25
Walnuts			
As purchased	1 lb.	32-35 nuts	.50
Shelled	1 lb.	4 cups	.60
Wesson Oil		1 pt. 3 fluid oz.	.35 - .40
Yeast			
Compressed		1 cake	.02
Dry		5 cakes	.05
Zwieback	6½ oz.	24 biscuits	.13

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